LISTING OF THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Original) A functional element, comprising a carrier with a surface and at least one microstructure arranged on the carrier surface, characterized in that the microstructure consists of individual components in the form of nanoparticles, which have molecule-specific recognition sites enabling the addressability of the microstructure.

2. (Original) The functional element as claimed in claim 1, wherein the microstructure covers a portion of the carrier surface and at least one of the area/length parameters of the covered portion of the carrier surface is smaller than 999 μm and at least 10 nm.

3. (Previously presented) The functional element as claimed in claim 1, wherein the carrier and/or the surface of the carrier consists of a metal, metal oxide, polymer, semiconductor material, glass and/or ceramic.

4. (Previously presented) The functional element as claimed in claim 1, wherein the surface of the carrier is planar.

5. (Previously presented) The functional element as claimed in claim 1, wherein the surface of the carrier is pre-structured.

6. (Previously presented) The functional element as claimed in claim 1, wherein the surface of the carrier has a layer of a chemical compound that prevents nonspecific attachment of biological molecules to the carrier surface.

7. (Previously presented) The functional element as claimed in claim 1, wherein a layer of a bonding agent is arranged between the carrier surface and the microstructure.

8. (Original) The functional element as claimed in claim 7, wherein the bonding agent is a polymer with charged or uncharged chemically reactive groups.

9. (Original) The functional element as claimed in claim 8, wherein the polymer is a hydrogel.

10. (Original) The functional element as claimed in claim 7, wherein the bonding agent is a plasma layer with charged or uncharged chemically reactive groups.

11. (Original) The functional element as claimed in claim 7, wherein the bonding agent is a self-assembled monolayer based on silane or thiol.

12. (Previously presented) The functional element as claimed in claim 7, wherein the bonding agent is switchable by altering the pH value, the ion concentration or the temperature.

13. (Previously presented) The functional element as claimed in claim 1, wherein the nanoparticles comprise a core and a surface that has the molecule-specific recognition sites.

14. (Original) The functional element as claimed in claim 13, wherein one or more biologically active molecules are bound to the molecule-specific recognition sites.

15. (Original) The functional element as claimed in claim 14, wherein the biologically active molecules are bound covalently and/or non-covalently.

16. (Previously presented) The functional element as claimed in claim 14, wherein the molecules are bound preserving their biological activity.

17. (Previously presented) The functional element as claimed in claim 14, wherein the bound molecules are proteins, nucleic acids, PNA molecules or fragments thereof.

18. (Original) The functional element as claimed in claim 16, wherein the proteins are antibodies, antigens, enzymes, cytokines or receptors.

19. (Previously presented) The functional element as claimed in claim 13, wherein the molecule-specific recognition sites comprise one or more first functional groups and the bound molecules comprise complementary second functional groups that bind the first functional groups.

20. (Original) The functional element as claimed in claim 19, wherein the first functional groups and the complementary second functional groups that bind the first functional groups are selected from the group comprising active ester, alkyl ketone group, aldehyde group, amino group, carboxy group, epoxy group, maleinimide group, hydrazine group, hydrazide group, thiol group, thioester group, oligohistidine group, Strep-tag I, Strep-tag II, desthiobiotin, biotin, chitin, chitin derivatives, chitin binding domain, metal chelate complex, streptavidin, streptactin, avidin and neutravidin.

21. (Previously presented) The functional element as claimed in claim 19, wherein the first and the second functional groups are produced by molecular imprinting.

22. (Previously presented) The functional element as claimed in claim 19, wherein the first functional groups are a component part of a spacer or are bound via spacers to the surface of the nanoparticles.

23. (Previously presented) The functional element as claimed in claim 19, wherein the complementary second functional groups are a component part of a spacer or are bound via spacers to the molecules.

24. (Previously presented) The functional element as claimed in claim 13, wherein the core of the nanoparticles consists of or contains an organic material.

25. (Original) The functional element as claimed in claim 24, wherein the organic material is an organic polymer.

26. (Previously presented) The functional element as claimed in claim 24, wherein the organic polymer is polypropylene, polystyrene, polyacrylate or a mixture thereof.

27. (Previously presented) The functional element as claimed in claim 13, wherein the core consists of or contains an inorganic material.

28. (Original) The functional element as claimed in claim 27, wherein the inorganic material is a metal such as Au, Ag or Ni, silicon, SiO_2, SiO, a silicate, Al_2O_3, $SiO_2 \cdot Al_2O_3$, Fe_2O_3, Ag_2O, TiO_2, ZrO_2, Zr_2O_3, Ta_2O_5, zeolite, glass, indium-tin oxide, hydroxylapatite, a Q-Dot or a mixture thereof.

29. (Currently amended) The functional element as claimed in claim 13 [[24]], wherein the core has a size from 5 nm to 500 nm.

30. (Currently amended) The functional element as claimed in claim 13 [[24]], wherein the core has at least one additional function.

31. (Original) The functional element as claimed in claim 30, wherein the additional function is anchored in the core and is a fluorescence marker, a UV/Vis marker, a superparamagnetic function, a ferromagnetic function and/or a radioactive marker.

32. (Original) The functional element as claimed in claim 30, wherein the surface of the core is modified with an organic or inorganic layer containing the first functional

groups, which has a fluorescence marker, a UV/Vis marker, a superparamagnetic function, a ferromagnetic function and/or a radioactive marker.

33. (Previously presented) The functional element as claimed in claim 30, wherein the surface of the core has a chemical compound, which serves for steric stabilization and/or for preventing a change of conformation of the immobilized molecules and/or for preventing the attachment of a further biologically active compound to the core.

34. (Original) The functional element as claimed in claim 33, wherein the chemical compound is a polyethylene glycol, an oligoethylene glycol, dextran or a mixture thereof.

35. (Currently amended) The functional element as claimed claim 14 [[34]], wherein the bound molecules have a marker.

36. (Currently amended) The functional element as claimed in claim 15 [[35]], wherein further molecules are bound to the bound molecules.

37. (Currently amended) The functional element as claimed in claim 1 [[36]], wherein the microstructure consists of a nanoparticle layer.

38. (Currently amended) The functional element as claimed in claim 1 [[37]], wherein the microstructure consists of several nanoparticle layers.

39. (Currently amended) The functional element as claimed in claim 1 [[38]],wherein several microstructures, which consist of nanoparticles with different molecule-specific recognition sites, are arranged on the carrier surface.

40. (Original) The functional element as claimed in claim 39, wherein various molecules are bound to the microstructures.

41. (Previously presented) The functional element as claimed in claim 1, obtainable by applying one or more microstructures to the carrier surface using a ring/pin printer.

42. (Previously presented) The functional element as claimed in claim 1, obtainable by applying one or more microstructures to the carrier surface using a lithographic process.

43. (Original) The functional element as claimed in claim 42, wherein the lithographic process is photolithography.

44. (Original) The functional element as claimed in claim 42, wherein the lithographic process is micropen lithography.

45. (Previously presented) The functional element as claimed in claim 1, obtainable by applying one or more microstructures to the carrier surface using an inkjet process.

46. (Previously presented) The functional element as claimed in claim 1, obtainable by applying one or more microstructures using a microcontact printing process.

47. (Currently amended) A method for the production of a functional element as claimed in claim 1 [[one of the preceding claims]], wherein at least one layer of a bonding agent and then at least one microstructure consisting of nanoparticles with molecule-specific recognition sites are applied to the surface of a carrier.

48. (Original) The method as claimed in claim 47, wherein the surface of the carrier is cleaned and/or activated before applying the layer of bonding agent.

49. (Original) The method as claimed in claim 48, wherein the carrier surface is activated chemically.

50. (Original) The method as claimed in claim 49, wherein the carrier surface is provided with charges.

51. (Previously presented) The method as claimed in claim 49, wherein the carrier surface is activated after applying a primer.

52. (Previously presented) The method as claimed in claim 49, wherein a self-assembly layer is applied to the carrier surface.

53. (Original) The method as claimed in claim 48, wherein the carrier surface is activated by means of a plasma.

54. (Previously presented) The method as claimed in claim 47, wherein a layer of bonding agent defined with respect to shape and area is applied to the carrier surface and the carrier is then dipped into a nanoparticle suspension, so that a microstructure that is defined with respect to shape and area is produced through adherence of the nanoparticles to the applied layer of bonding agent.

55. (Original) The method as claimed in claim 54, wherein the layer of bonding agent defined with respect to shape and area is applied by means of a ring/pin printer, a lithographic process, an inkjet process or a microcontact printing process.

56. (Previously presented) The method as claimed in claim 47, wherein the carrier is dipped into a suspension or solution of the bonding agent, so that a layer of bonding agent covering the whole carrier surface is produced, and then the nanoparticles are applied in such a way that a microstructure defined with respect to shape and area is produced.

57. (Original) The method as claimed in claim 56, wherein the microstructure defined with respect to shape and area is applied by means of a ring/pin printer, a lithographic process, an inkjet process or a microcontact printing process.

58. (Previously presented) The method as claimed in claim 47, wherein the bonding agent and the nanoparticles are applied to the carrier surface several times.

59. (Previously presented) The method as claimed in claim 47, wherein biologically active molecules are bound to the molecule-specific recognition sites of the nanoparticles before the nanoparticles are applied.

60. (Previously presented) The method as claimed in claim 47, wherein biologically active molecules are bound to the molecule-specific recognition sites of the nanoparticles after application of the nanoparticles.

61. (Previously presented) The method as claimed in claim 47, wherein biologically active molecules are bound to the molecule-specific recognition sites of the nanoparticles before and after application of the nanoparticles.

62. (Previously presented) The method as claimed in claim 59, wherein the binding of the biologically active molecules to the molecule-specific recognition sites of the nanoparticles is effected by bringing the molecule-specific recognition sites of the nanoparticles, which have first functional groups, into contact with the molecules that have complementary second functional groups that bind the first functional groups, in such a way that covalent and/or non-covalent bonds are effected between the functional groups of the molecule-specific recognition sites and the molecules.

63. (Original) The method as claimed in claim 62, wherein the first functional groups and the complementary second functional groups that bind the first functional

groups are selected from the group comprising active ester, alkyl ketone group, aldehyde group, amino group, carboxy group, epoxy group, maleinimide group, hydrazine group, hydrazide group, thiol group, thioester group, oligohistidine group, Strep-tag I, Strep-tag II, desthiobiotin, biotin, chitin, chitin derivatives, chitin binding domain, metal chelate complex, streptavidin, streptactin, avidin and neutravidin.

64. (Previously presented) The method as claimed in claim 59, wherein the biologically active molecules are bound while retaining their biological activity.

65. (Previously presented) The method as claimed in claim 59, wherein the molecules are proteins, antigens, nucleic acids, PNA molecules or fragments thereof.

66. (Canceled)

67. (Canceled)

68. (Canceled)

69. (Canceled)

70. (Canceled)

71. (Canceled)

72. (Canceled).

73. (Canceled)

74. (Canceled)

75. (Canceled

76. (Canceled)

77. (Canceled)

78. (Currently amended) A method of detection comprising the step of using a functional element as claimed in claim 1 or a functional element produced by the method of claim 47.

79. (Canceled)

80. (Currently amended) A method of controlling cellular adhesion or cellular growth comprising the step of using a functional element as claimed in claim 1 or a functional element produced by the method of claim 47.

81. (Canceled)

82. (Currently amended) A method of developing pharmaceutical preparations comprising the step of using a functional element as claimed in claim 1 or a functional element produced by the method of claim 47.

83. (Canceled)

84. (Currently amended) A method for analyzing the effects or side effects of pharmaceutical preparations comprising the step of using a functional element as claimed in claim 1 or a functional element produced by the method of claim 47.

85. (Canceled)

86. (Currently amended) A method for diagnosing disease comprising the step of using the functional element of claim 1 or a functional element produced by the method of claim 47.

87. (Canceled)

88. (Currently amended) A method of analyzing microbiological contamination of samples comprising the step of using the functional element of claim 1 or a functional element produced by the method of claim 47.

89. (Canceled)

90. (Currently amended) A biocomputer including, as an electronic component thereof, the functional element of claim 1 or a functional element produced by the method of claim 47.

91. (Canceled)

92. (New) The method as claimed in claim 78, wherein the detection method is MALDI mass spectroscopy, fluorescence or UV-Vis spectroscopy, fluorescence or light microscopy, waveguide spectroscopy, impedance spectroscopy or another electrical method.

93. (New) The method as claimed in claim 86, wherein pathogens are identified.

94. (New) The method as claimed in claim 86, wherein mutated genes in a human being or an animal are identified.

95. (New) The method as claimed in claim 88, wherein the sample is a water sample or a soil sample.

96. (New) The method as claimed in claim 88, wherein the sample is obtained from foodstuff or animal feed.